

aminoalkyl, saccharides, peptides, $-\text{CH}_2(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-$, $-(\text{CH}_2)_a-\text{CO}-$, $-(\text{CH}_2)_a-\text{CONH}-$, $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-\text{CONH}-$, $-(\text{CH}_2)_a-\text{NHCO}-$, $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-\text{NHCO}-$, $-(\text{CH}_2)_a-\text{O}-$, and $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CO}-$; Bm and Dm are independently selected from the group consisting of bioactive peptides, proteins, cells,

- 5 antibodies, antibody fragments, saccharides, glycopeptides, peptidomimetics, drugs, drug mimics, hormones, metal chelating agents, radioactive or nonradioactive metal complexes, echogenic agents, photoactive molecules, and phototherapy agents; a and c independently vary from 1 to 20; b and d independently vary from 1 to 100; and

thereafter performing said procedure.

9. The method for performing the diagnostic and therapeutic procedure of claim 8 comprising administering to an individual an effective amount of the composition of cyanine dye bioconjugate wherein W_1 and W_2 are independently selected from the group consisting of $-\text{C}(\text{CH}_3)_2$,

- 5 $-\text{C}((\text{CH}_2)_a\text{OH})\text{CH}_3$, $-\text{C}((\text{CH}_2)_a\text{OH})_2$, $-\text{C}((\text{CH}_2)_a\text{CO}_2\text{H})\text{CH}_3$, $-\text{C}((\text{CH}_2)_a\text{CO}_2\text{H})_2$, $-\text{C}((\text{CH}_2)_a\text{NH}_2)\text{CH}_3$, $-\text{C}((\text{CH}_2)_a\text{NH}_2)_2$, $-\text{C}((\text{CH}_2)_a\text{NR}^{12}\text{R}^{13})_2$, $-\text{NR}^{12}$, and $-\text{S}-$; Y_1 and Y_2 are selected from the group consisting of hydrogen, tumor-specific agents, $-\text{CONH}-\text{Bm}$, $-\text{NHCO}-\text{Bm}$, $-(\text{CH}_2)_a-\text{CONH}-\text{Bm}$, $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-\text{CONH}-\text{Bm}$, $-(\text{CH}_2)_a-\text{NHCO}-\text{Bm}$, $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-\text{NHCO}-\text{Bm}$, $-(\text{CH}_2)_a-\text{NR}^{12}\text{R}^{13}$, and
- 10 $-\text{CH}_2(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2\text{NR}^{12}\text{R}^{13}$; Z_1 and Z_2 are independently selected from the group consisting of hydrogen, phototherapy agents, $-\text{CONH}-\text{Dm}$, $-\text{NHCO}-\text{Dm}$, $-(\text{CH}_2)_a-\text{CONH}-\text{Dm}$, $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-\text{CONH}-\text{Dm}$, $-(\text{CH}_2)_a-\text{NHCO}-\text{Dm}$, $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-\text{NHCO}-\text{Dm}$, $-(\text{CH}_2)_a-\text{NR}^{12}\text{R}^{13}$, and $-\text{CH}_2(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2\text{NR}^{12}\text{R}^{13}$; K_1 and K_2 are independently selected from the group consisting of
- 15 C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{20} alkoxy, C_1-C_{20} aminoalkyl, $-(\text{CH}_2)_a-\text{CO}-$, $-(\text{CH}_2)_a-$

CONH-, $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-\text{CONH}-$, $-(\text{CH}_2)_a-\text{NHCO}-$, $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CH}_2-\text{NHCO}-$, and $-\text{CH}_2-(\text{CH}_2\text{OCH}_2)_b-\text{CO}-$; X_1 and X_2 are single bonds, or are independently selected from the group consisting of nitrogen, $-\text{CR}^{14}-$, $-\text{CR}^{14}\text{R}^{15}$, and $-\text{NR}^{16}\text{R}^{17}$; Q is a single bond or is selected from the group consisting of $-\text{O}-$, $-\text{S}-$, and $-\text{NR}^{18}$; a_1 and b_1 independently vary from 0 to 3; B_m is selected from the group consisting of bioactive peptides containing 2 to 30 amino acid units, proteins, antibody fragments, mono- and oligosaccharides; D_m is selected from the group consisting of photosensitizers, photoactive molecules, and phototherapy agents; a and c independently vary from 1 to 10; b and d independently vary from 1 to 30.

10. The method for performing the diagnostic and therapeutic procedure of claim 9 comprising administering to an individual an effective amount of the composition of cyanine dye bioconjugate wherein each W_1 and W_2 is $-\text{C}(\text{CH}_3)_2$; each K_1 and K_2 is $-(\text{CH}_2)_4\text{CO}-$; each Q, X_1 and X_2 is a single bond; each R^1 to R^9 , Y_1 and Z_1 is H; Y_2 is a tumor-specific agent; and Z_2 is a phototherapy agent.

11. The method for performing the diagnostic and therapeutic procedure of claim 10 comprising administering to an individual an effective amount of the composition of cyanine dye bioconjugate wherein the said tumor-specific agent is a bioactive peptide containing 2 to 30 amino acid units.

12. The method for performing the diagnostic and therapeutic procedure of claim 11 comprising administering to an individual an effective

amount of the composition of cyanine dye bioconjugate wherein the said tumor-specific agent is octreotate and bombesin (7-14).

13. The method for performing the diagnostic and therapeutic procedure of claim 10 comprising administering to an individual an effective amount of the composition of cyanine dye bioconjugate wherein the said phototherapy agent is a photosensitizer.

14. The method for performing the diagnostic and therapeutic procedure of claim 13 comprising administering to an individual an effective amount of the composition of cyanine dye bioconjugate wherein the said photosensitizer is 2-[1-hexyloxyethyl]-2-devinylpyropheophorbide-a.

15. The method of claim 8 wherein said procedure utilizes light of wavelength in the region of 300-1300 nm.

16. The method of claim 8 wherein the diagnostic procedure is optical tomography.

17. The method of claim 8 wherein said diagnostic procedure is fluorescence endoscopy.

18. The method of claim 8 wherein said procedure further comprises a step of imaging and therapy wherein said imaging and therapy is selected from the group consisting of absorption, light scattering, photoacoustic and sonofluoresence technique.